Text Part Number: 78-6633-01

Replacing the Cisco 3660 Router Backplane

Product Number: CISCO3660-Backplane=, CISCO3660-Backplane-CO=

This document describes how to replace the system backplane in Cisco 3660 routers.

Use this document in conjunction with the *Cisco 3600 Series Hardware Installation Guide*, *Software Configuration Guide* for Cisco 3600 Series and Cisco 2600 Series Routers, and the *Regulatory Compliance and Safety Information* document for your router. If you have questions or need help, refer to the section "Cisco Connection Online" later in this document.

This document contains the following sections:

- Safety Recommendations, page 1
- Tools and Equipment Needed, page 5
- Removing the Cisco 3660 Backplane, page 5
- Replacing the Cisco 3660 Backplane, page 13
- Replacing Connections to the Router, page 17
- Cisco Connection Online, page 17
- Documentation CD-ROM, page 18

Safety Recommendations

Follow these guidelines to ensure general safety:

- Keep the area clear and dust-free during and after installation.
- Keep tools away from walk areas where you or others could fall over them.
- Do not wear loose clothing that could get caught in the chassis. Fasten your tie or scarf and roll up your sleeves.
- Wear safety glasses when working under any conditions that might be hazardous to your eyes.
- Do not perform any action that creates a potential hazard to people or makes equipment unsafe.

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Safety Warnings

Safety warnings appear throughout this publication in procedures that, if performed incorrectly, may harm you. A warning symbol precedes each warning statement.

Warning Means *danger.* You are in a situation that could cause bodily injury. Before you work on any equipment, be aware of the hazards involved with electrical circuitry and be familiar with standard practices for preventing accidents. To see translations of the warnings that appear in this publication, refer to the *Regulatory Compliance and Safety Information* document that accompanied this device.

Waarschuwing Dit waarschuwingssymbool betekent gevaar. U verkeert in een situatie die lichamelijk letsel kan veroorzaken. Voordat u aan enige apparatuur gaat werken, dient u zich bewust te zijn van de bij elektrische schakelingen betrokken risico's en dient u op de hoogte te zijn van standaard maatregelen om ongelukken te voorkomen. Voor vertalingen van de waarschuwingen die in deze publicatie verschijnen, kunt u het document *Regulatory Compliance and Safety Information* (Informatie over naleving van veiligheids- en andere voorschriften) raadplegen dat bij dit toestel is ingesloten.

Varoitus Tämä varoitusmerkki merkitsee vaaraa. Olet tilanteessa, joka voi johtaa ruumiinvammaan. Ennen kuin työskentelet minkään laitteiston parissa, ota selvää sähkökytkentöihin liittyvistä vaaroista ja tavanomaisista onnettomuuksien ehkäisykeinoista. Tässä julkaisussa esiintyvien varoitusten käännökset löydät laitteen mukana olevasta *Regulatory Compliance and Safety Information* -kirjasesta (määräysten noudattaminen ja tietoa turvallisuudesta).

Attention Ce symbole d'avertissement indique un danger. Vous vous trouvez dans une situation pouvant causer des blessures ou des dommages corporels. Avant de travailler sur un équipement, soyez conscient des dangers posés par les circuits électriques et familiarisez-vous avec les procédures couramment utilisées pour éviter les accidents. Pour prendre connaissance des traductions d'avertissements figurant dans cette publication, consultez le document *Regulatory Compliance and Safety Information* (Conformité aux règlements et consignes de sécurité) qui accompagne cet appareil.

Warnung Dieses Warnsymbol bedeutet Gefahr. Sie befinden sich in einer Situation, die zu einer Körperverletzung führen könnte. Bevor Sie mit der Arbeit an irgendeinem Gerät beginnen, seien Sie sich der mit elektrischen Stromkreisen verbundenen Gefahren und der Standardpraktiken zur Vermeidung von Unfällen bewußt. Übersetzungen der in dieser Veröffentlichung enthaltenen Warnhinweise finden Sie im Dokument *Regulatory Compliance and Safety Information* (Informationen zu behördlichen Vorschriften und Sicherheit), das zusammen mit diesem Gerät geliefert wurde.

Avvertenza Questo simbolo di avvertenza indica un pericolo. La situazione potrebbe causare infortuni alle persone. Prima di lavorare su qualsiasi apparecchiatura, occorre conoscere i pericoli relativi ai circuiti elettrici ed essere al corrente delle pratiche standard per la prevenzione di incidenti. La traduzione delle avvertenze riportate in questa pubblicazione si trova nel documento *Regulatory Compliance and Safety Information* (Conformità alle norme e informazioni sulla sicurezza) che accompagna questo dispositivo.

Advarsel Dette varselsymbolet betyr fare. Du befinner deg i en situasjon som kan føre til personskade. Før du utfører arbeid på utstyr, må du vare oppmerksom på de faremomentene som elektriske kretser innebærer, samt gjøre deg kjent med vanlig praksis når det gjelder å unngå ulykker. Hvis du vil se oversettelser av de advarslene som finnes i denne publikasjonen, kan du se i dokumentet *Regulatory Compliance and Safety Information* (Overholdelse av forskrifter og sikkerhetsinformasjon) som ble levert med denne enheten.

Aviso Este símbolo de aviso indica perigo. Encontra-se numa situação que lhe poderá causar danos físicos. Antes de começar a trabalhar com qualquer equipamento, familiarize-se com os perigos relacionados com circuitos eléctricos, e com quaisquer práticas comuns que possam prevenir possíveis acidentes. Para ver as traduções dos avisos que constam desta publicação, consulte o documento *Regulatory Compliance and Safety Information* (Informação de Segurança e Disposições Reguladoras) que acompanha este dispositivo.

¡Advertencia! Este símbolo de aviso significa peligro. Existe riesgo para su integridad física. Antes de manipular cualquier equipo, considerar los riesgos que entraña la corriente eléctrica y familiarizarse con los procedimientos estándar de prevención de accidentes. Para ver una traducción de las advertencias que aparecen en esta publicación, consultar el documento titulado *Regulatory Compliance and Safety Information* (Información sobre seguridad y conformidad con las disposiciones reglamentarias) que se acompaña con este dispositivo.

Varning! Denna varningssymbol signalerar fara. Du befinner dig i en situation som kan leda till personskada. Innan du utför arbete på någon utrustning måste du vara medveten om farorna med elkretsar och känna till vanligt förfarande för att förebygga skador. Se förklaringar av de varningar som förkommer i denna publikation i dokumentet *Regulatory Compliance and Safety Information* (Efterrättelse av föreskrifter och säkerhetsinformation), vilket medföljer denna anordning.

Warning Read the installation instructions before you connect the system to its power source.

Warning Only trained and qualified personnel should be allowed to install or replace this equipment.

Warning Before working on a chassis or working near power supplies, unplug the power cord on AC units; disconnect the power at the circuit breaker on DC units.

Warning Ultimate disposal of this product should be handled according to all national laws and regulations.

Safety with Electricity

Warning The ISDN connection is regarded as a source of voltage that should be inaccessible to user contact. Do not attempt to tamper with or open any public telephone operator (PTO)-provided equipment or connection hardware. Any hardwired connection (other than by a nonremovable, connect-one-time-only plug) must be made only by PTO staff or suitably trained engineers.

Warning Before working on equipment that is connected to power lines, remove jewelry (including rings, necklaces, and watches). Metal objects will heat up when connected to power and ground and can cause serious burns or weld the metal object to the terminals.

Warning To avoid electric shock, do not connect safety extra-low voltage (SELV) circuits to telephone-network voltage (TNV) circuits. LAN ports contain SELV circuits, and WAN ports contain TNV circuits. Both LAN and WAN ports may use RJ-45 connectors. Use caution when connecting cables.

Warning Hazardous network voltages are present in WAN ports regardless of whether power to the router is OFF or ON. To avoid electric shock, use caution when working near WAN ports. When detaching cables, detach the end away from the router first.

Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages.

Warning Do not work on the system or connect or disconnect cables during periods of lightning activity.

Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is OFF and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.

Follow these guidelines when working on equipment powered by electricity:

- Locate the emergency power-OFF switch in the room in which you are working. Then, if an electrical accident occurs, you can quickly shut the power OFF.
- Before working on the router, turn OFF the power and unplug the power cord.
- Disconnect all power before doing the following:
  - Installing or removing a router chassis
  - Working near power supplies
  - Performing most hardware upgrades
- Do not work alone if potentially hazardous conditions exist.
- Never assume that power is disconnected from a circuit. Always check.
- Look carefully for possible hazards in your work area, such as moist floors, ungrounded power extension cables, and missing safety grounds.

- If an electrical accident occurs, proceed as follows:
  - Use caution; do not become a victim yourself.
  - Turn OFF power to the router.
  - If possible, send another person to get medical aid. Otherwise, determine the condition of the victim and then call for help.
  - Determine if the victim needs rescue breathing or external cardiac compressions; then take appropriate action.

Preventing Electrostatic Discharge Damage

Electrostatic discharge (ESD) can damage equipment and impair electrical circuitry. ESD can occur when printed circuit cards are improperly handled, and can result in complete or intermittent failures. Always follow ESD prevention procedures when removing and replacing cards. Ensure that the router chassis is electrically connected to earth ground. Wear an ESD-preventive wrist strap, ensuring that it makes good skin contact. Connect the clip to an unpainted surface of the chassis frame to safely channel unwanted ESD voltages to ground. To guard against ESD damage and shocks, the wrist strap and cord must be used properly. If no wrist strap is available, ground yourself by touching the metal part of the chassis.

Caution For safety, periodically check the resistance value of the antistatic strap, which should be between 1 and 10 megohms (Mohm).

Tools and Equipment Needed

You need the following tools and equipment to remove and reinstall system components, including the backplane in a Cisco 3660 router:

- Number 15 Torx screwdriver
- Number 2 Phillips screwdriver
- ESD-preventive wrist strap
- Antistatic mat

Removing the Cisco 3660 Backplane

Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is OFF and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.

Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

To remove the backplane, complete these procedures in the order listed:

- Detaching Components from the Backplane, page 6
- Removing the Fan Cage Assembly, page 11
- Removing the Backplane, page 12

Detaching Components from the Backplane

This section describes how to detach system components plugged into the router backplane. For more information on removing these components, see the publication *Cisco 3600 Series Hardware Installation Guide*.

Step 1 Power OFF the router. However, to channel ESD voltages to ground, do not unplug the power cable.

Step 2 If the router was rack-mounted, remove it from the rack and place it on a level work surface.

Warning Two people are required to lift the chassis. Grasp the chassis underneath the lower edge and lift with both hands. To prevent injury, keep your back straight and lift with your legs, not your back. To prevent damage to the chassis and components, never attempt to lift the chassis with the handles on the power supplies or on the interface modules. These handles were not designed to support the weight of the chassis.

Step 3 Position the chassis with the rear panel facing you.

Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages.

Step 4 Remove all network interface cables from the router's rear panel.

Step 5 Detach the following system components:

- Detaching Power Supplies, page 6
- Detaching the Mainboard, page 7
- Detaching the Chassis Shield, page 9
- Detaching Network Modules, page 10

Note The power supplies, mainboard, and network modules need not be removed from the router chassis. They can remain in the chassis as long as they are completely detached from the backplane.

Detaching Power Supplies

Warning Do not touch the power supply when the power cord is connected. For systems with a power switch, line voltages are present within the power supply even when the power switch is off and the power cord is connected. For systems without a power switch, line voltages are present within the power supply when the power cord is connected.

Use the following procedure to remove a power supply:

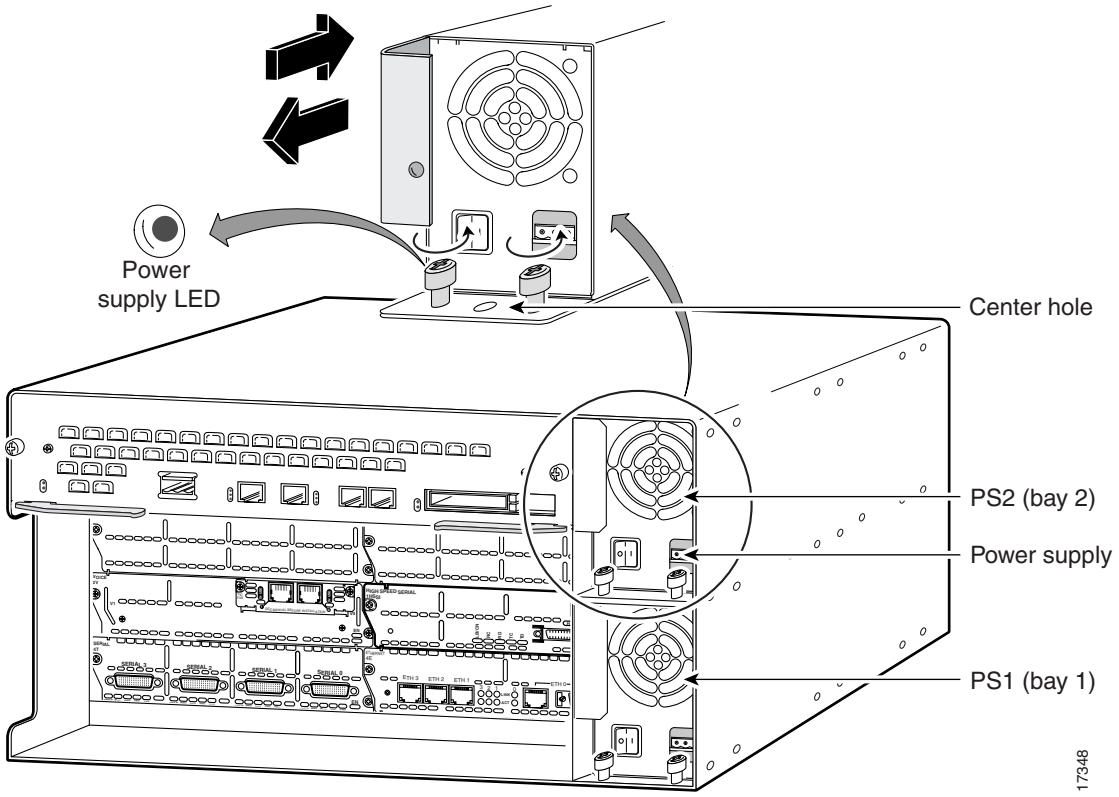
Step 1 Turn OFF power to the installed power supplies and unplug the power cables.

Note Always unplug the power cable before loosening the captive screws. If the power cable is still plugged in, it prevents the captive screws from being loosened adequately to remove the power supply.

Step 2 Loosen the two captive screws holding each power supply in the chassis bay, using the Phillips screwdriver. (See Figure 1.)

Step 3 Slide each power supply out of its bay.

Figure 1 Removing and Replacing a Cisco 3660 Router Power Supply



Detaching the Mainboard

Warning Before performing any of the following procedures, ensure that power is removed from the DC circuit. To ensure that all power is OFF, locate the circuit breaker on the panel board that services the DC circuit, switch the circuit breaker to the OFF position, and tape the switch handle of the circuit breaker in the OFF position.

Use the following procedure to remove the mainboard tray:

Step 1 Power OFF the router. However, to channel ESD voltages to ground, do not unplug the power cable.

Warning Before opening the chassis, disconnect the telephone-network cables to avoid contact with telephone-network voltages.

Step 2 Remove all network interface cables from the rear panel of the mainboard tray.

Step 3 Place the router so that the rear panel is facing you.

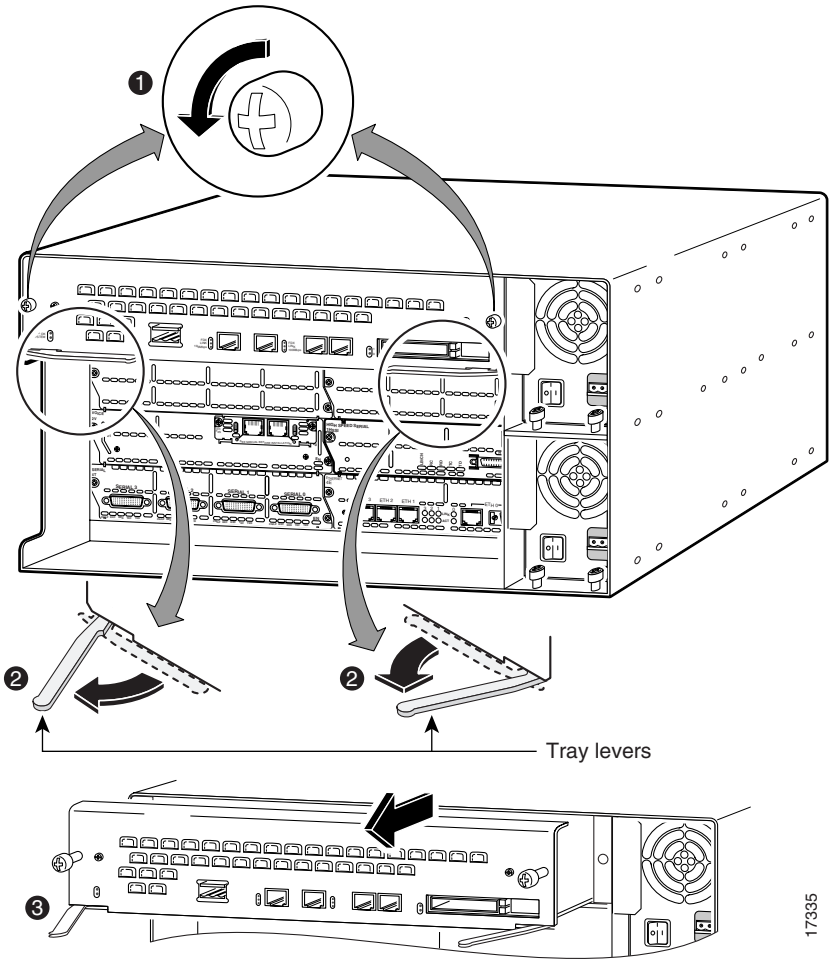
Locate the two sets of screws on the mainboard rear panel: one set of captive screws and one set of Torx screws. (See Figure 2.)

Caution Do not remove or loosen the Torx screws.

Step 4 Loosen the two captive screws located in the upper corners. (See part 1 in Figure 2.)

Step 5 Swing the two tray levers out, and slide the mainboard tray out of the chassis. (See parts 2 and 3 in Figure 2.)

Figure 2 Removing the Cisco 3660 Mainboard Tray

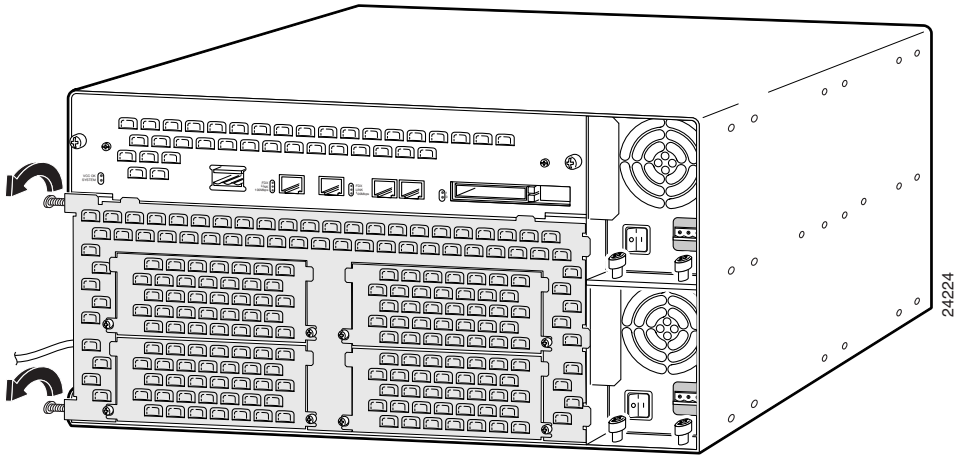


Caution The mainboard is an ESD-sensitive component. To avoid damage, observe all ESD precautions.

Detaching the Chassis Shield

In order to access the network modules, loosen the two captive screws securing the chassis shield to the router. (See Figure 3.)

Figure 3 Removing and Replacing the Chassis Shield on the Cisco 3660 Router



Detaching Network Modules

Use the following procedure to remove a network module:

Step 1 Unplug all network interface cables connected to the network module.

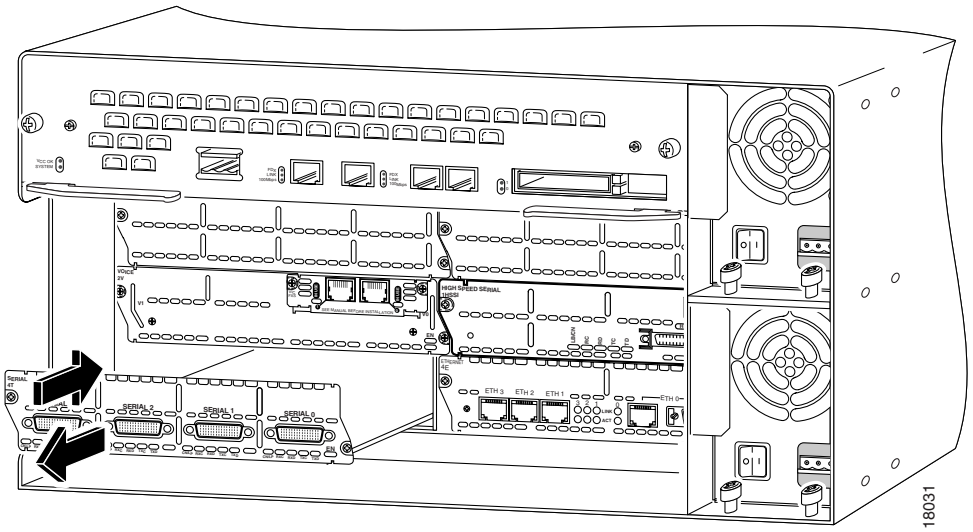
Step 2 Loosen the two captive screws holding the network module in the chassis slot. (See Figure 4.)

Step 3 Slide the network module out of the slot. (See Figure 4.)

Step 4 Repeat this procedure for every network module installed in your router.

Note Do not remove any blank network module panels that may be installed in your router.

Figure 4 Removing and Replacing Network Modules

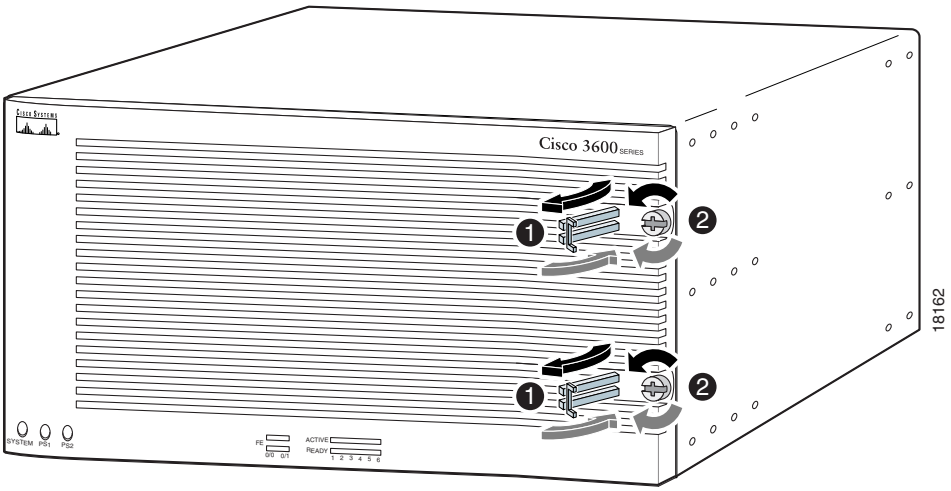


Removing the Fan Cage Assembly

Use the following procedure to remove the bezel/fan cage assembly:

Step 1 Facing the front of the router, locate the two screw covers on the bezel's right edge. (See part 1 in Figure 5.)

Figure 5 Removing the Bezel Screws



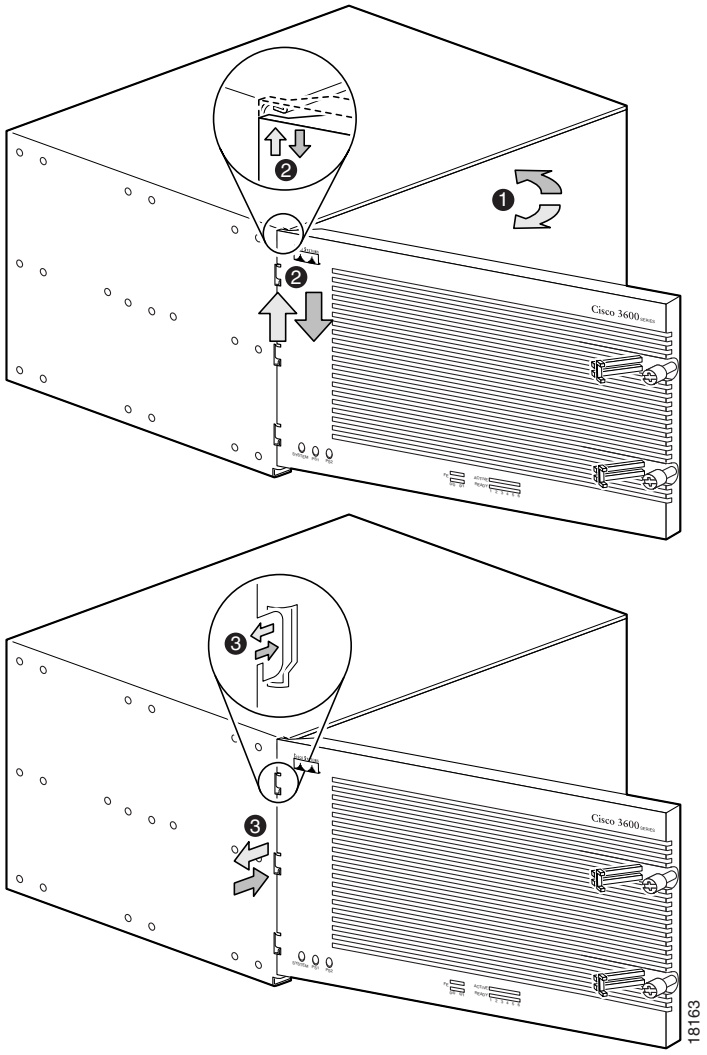
Step 2 Using the Phillips screwdriver, loosen the two captive screws. (See part 2 in Figure 5.)

Step 3 Swing out the bezel/fan cage assembly (to approximately 85 degrees), and lift it slightly to disengage it from the chassis tab slots. (See parts 1 and 2 in Figure 6.)

Caution Do not swing the bezel/fan cage assembly further than 90 degrees out from the chassis. Doing so will bend the tabs and prevent correct installation of the bezel/fan cage assembly.

Step 4 Separate the bezel/fan cage assembly from the chassis. (See part 3 in Figure 6.)

Figure 6 Removing the Bezel and Fan Cage Assembly



Removing the Backplane

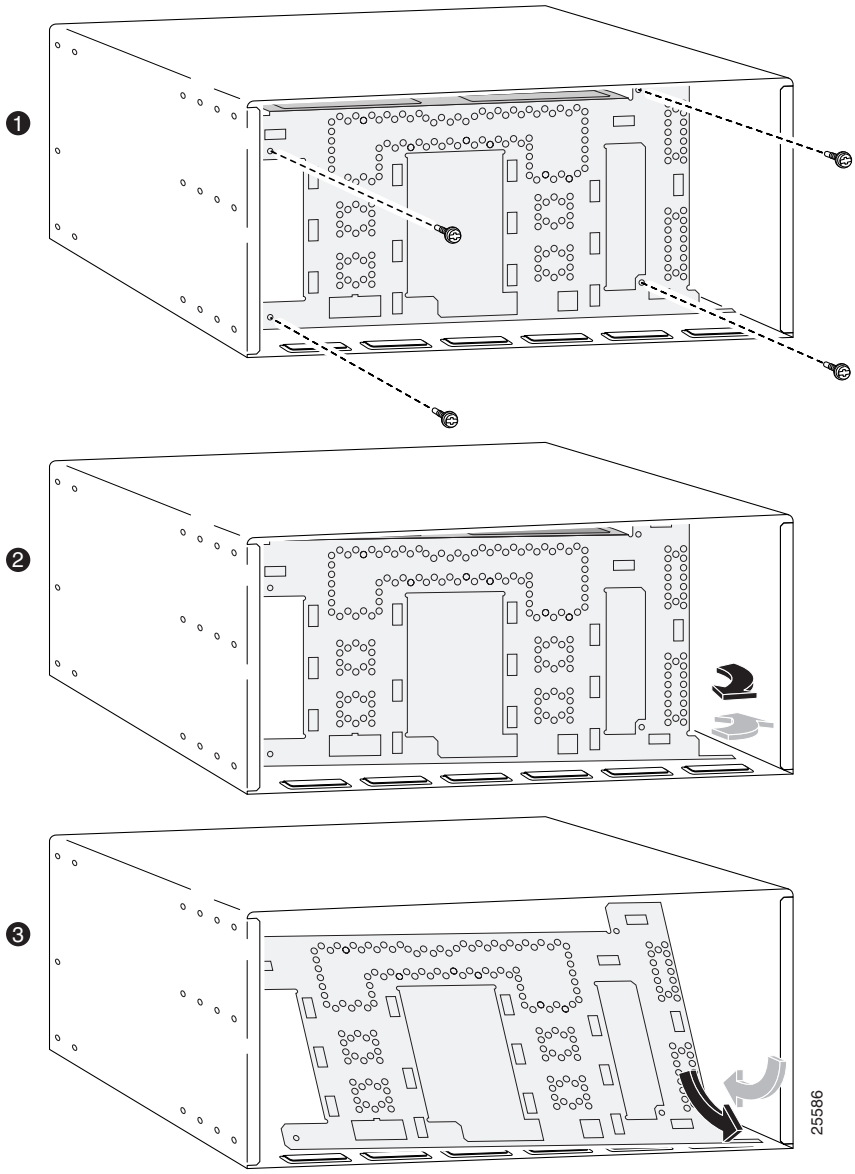
Caution The backplane is an ESD-sensitive component. To avoid damage, observe all ESD precautions.

Step 1 Using the Torx screwdriver, remove the four Torx screws from the corners of the backplane. (See part 1 in Figure 7.)

Keep these screws in a safe place. They will be used to install the replacement backplane.

Step 2 Pivot the right side of the backplane out of the chassis, angle the backplane slightly (to clear the EMI fingers on the top edge of the chassis), and remove the backplane from the chassis. (See parts 2 and 3 in Figure 7.)

Figure 7 Removing and Replacing the Cisco 3660 Backplane



When you are ready to replace the backplane, see the "Replacing the Cisco 3660 Backplane" section on page 13.

Replacing the Cisco 3660 Backplane

To replace the backplane and other system components, complete these procedures in the order listed:

- Installing the Backplane, page 14
- Installing the Fan Cage Assembly, page 14
- Installing Components that Plug into the Backplane, page 14

Installing the Backplane

Caution The backplane is an ESD-sensitive component. To avoid damage, observe all ESD precautions.

This procedure describes how to replace the backplane:

Step 1 Position the chassis so that the front panel faces you.

Step 2 Angle the backplane slightly (to clear the EMI fingers on the top edge of the chassis), pivot the right side of the backplane, and align the backplane in the chassis. (See parts 2 and 3 in Figure 7.)

Note Align the backplane so that the connectors face the rear of the router.

Step 1 Using the Torx screwdriver, secure the backplane to the chassis using the Torx screws removed earlier in Step 1 of the "Removing the Backplane" section on page 12.

To ensure correct alignment, install the screws in this order (see Figure 7):

1. Upper left corner screw
2. Lower left corner screw
3. Upper and lower right corner screws

Installing the Fan Cage Assembly

Use the following procedure to replace the fan cage assembly:

Step 1 Facing the front of the router, align the tabbed edge of the bezel/fan cage assembly with the chassis tab slots (see part 3 in Figure 6), and push down slightly to engage the tabs (see part 2 in Figure 6).

Step 2 Swing the bezel/fan cage assembly into the chassis. (See part 1 in Figure 6.)

Step 3 Locate the two screw covers on the bezel's right edge. (See part 1 in Figure 5.)

Step 4 Using the Phillips screwdriver, tighten the two captive screws and close the screw covers. (See part 2 in Figure 5.)

Installing Components that Plug into the Backplane

This section describes the following procedures:

- Installing the Mainboard, page 15
- Installing Network Modules, page 16
- Installing the Chassis Shield, page 16
- Installing Power Supplies, page 16

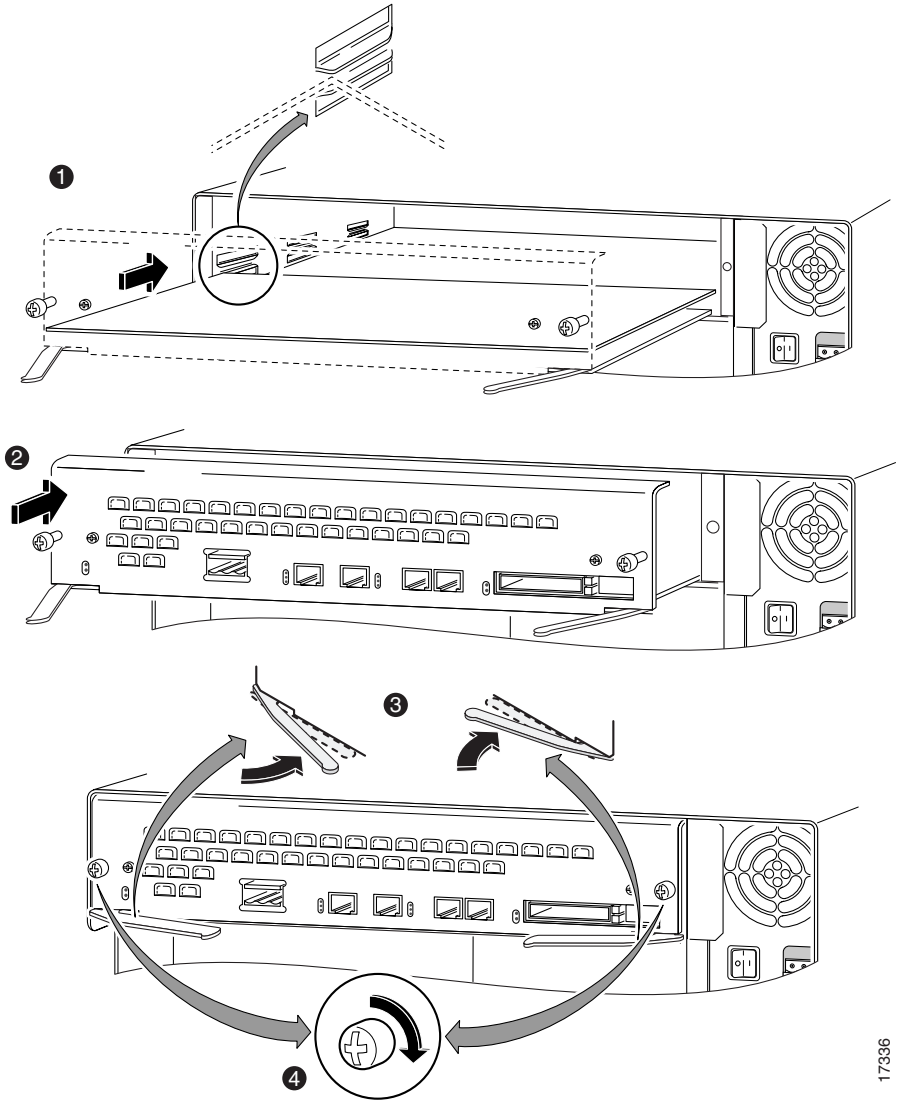
Installing the Mainboard

This section describes how to replace the mainboard tray:

Step 1 Place the chassis so the rear panel faces you.

Step 2 Hold the tray so that the tabs at the tray's lower corners are aligned with the ledge in the chassis opening. (See part 1 in Figure 8.)

Figure 8 Replacing the Cisco 3660 Mainboard Tray



Step 3 Slide the mainboard tray into the chassis until firm contact is made with the backplane. (See part 2 in Figure 8.)

Step 4 Push the levers at the lower corners of the mainboard inward. (See part 3 in Figure 8.)

Step 5 Tighten the two captive screws previously loosened in Step 2 of the "Detaching the Mainboard" section on page 7. (See part 4 in Figure 8.)

Installing Network Modules

Use the following procedure to install a network module:

Step 1 Slide the network module gently into the slot. (See Figure 4.)

Step 2 Push the module into place until you feel its edge connector mate securely with the connector on the backplane.

Step 3 Tighten the two captive screws that secure the network module in the chassis slot, using the Phillips screwdriver. (See Figure 4.)

Step 4 Reconnect the network interface cables previously removed in Step 1 of the "Detaching Network Modules" section on page 10.

Step 5 Repeat this procedure for every network module that you reinstall in the chassis.

Installing the Chassis Shield

When you have finished replacing network modules, replace the chassis shield as described:

Step 1 Align the chassis shield with the rear panel of the router. (See Figure 3.)

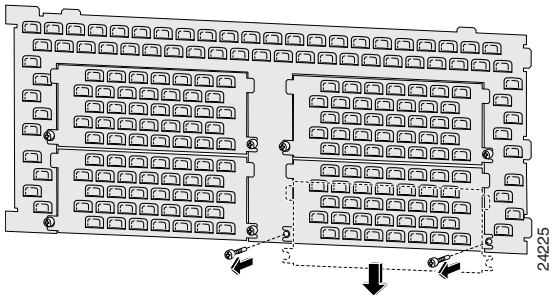
Step 2 Secure the louvered chassis shield by tightening the two captive screws at the side of the shield. (See Figure 3.)

Step 3 Reinstall network cables.

Step 4 If necessary, remove one or more of the cable panels on the chassis shield (see Figure 9), and route cables through this opening.

This prevents the cables from being bent or stressed by the chassis shield.

Figure 9 Removing Cable Panels



Installing Power Supplies

Use the following procedure to reinstall the power supplies:

Step 1 Place the router so that the rear panel faces you.

Step 2 Check that the power switch on the power supply is in the OFF position.

Step 3 Slide the power supply into its bay until the center hole (between the captive screws) is aligned with the hole in the bay's lower shelf. (See Figure 1.)

Step 4 Tighten the two captive screws that secure the power supply in the chassis bay, using the Phillips screwdriver.

Step 5 Connect the power cord to the power supply.

Note The power cord connector can be inserted in the power socket only when the captive screws are tightened. This prevents hot swapping of live power supplies.

For more information on hot swapping Cisco 3660 router components, see the publication *Cisco 3600 Series Hardware Installation Guide*.

Step 6 If necessary, repeat this procedure for the second power supply.

Replacing Connections to the Router

Follow these steps to make final connections to the router:

Warning Read the installation instructions before you connect the system to its power source.

Step 1 Replace all network connections.

Step 2 If you have an AC-powered router, plug the power cord into a 3-terminal, single-phase power source that provides power within the acceptable range (100 to 240 VAC, 50 to 60 Hz).

If you have a DC-powered router, remove the tape from the circuit breaker switch handle and reinstate power by moving the handle of the circuit breaker to the ON position.

Step 3 Turn ON power switches on the installed power supplies.

Step 4 Check that the LED on each power supply is green. (See Figure 1 for the location of the power supply LED.)

Step 5 Check that the power supply LED (PS1, PS2) on the front panel is green.

Step 6 Turn ON the router power switch. The power LED on the front panel of the router should go ON.

Step 7 Check the OK LED on the right side of the front panel to verify that it goes ON after a few seconds delay when booting.

Step 8 Check that the network module LEDs light up, and that the Active/Ready LEDs on the front panel also light up.

For an explanation of network module LEDs see the publication *Cisco Network Modules Hardware Installation Guide*. For an explanation of Active/Ready LEDs, see the publication *Cisco 3600 Series Hardware Installation Guide*.

Step 9 If you have problems, see the "Cisco Connection Online" section on page 17.

Cisco Connection Online

Cisco Connection Online (CCO) is Cisco Systems' primary, real-time support channel. Maintenance customers and partners can self-register on CCO to obtain additional information and services.

Available 24 hours a day, 7 days a week, CCO provides a wealth of standard and value-added services to Cisco's customers and business partners. CCO services include product information, product documentation, software updates, release notes, technical tips, the Bug Navigator, configuration notes, brochures, descriptions of service offerings, and download access to public and authorized files.

CCO serves a wide variety of users through two interfaces that are updated and enhanced simultaneously: a character-based version and a multimedia version that resides on the World Wide Web (WWW). The character-based CCO supports Zmodem, Kermit, Xmodem, FTP, and Internet e-mail, and it is excellent for quick access to information over lower bandwidths. The WWW version of CCO provides richly formatted documents with photographs, figures, graphics, and video, as well as hyperlinks to related information.

You can access CCO in the following ways:

- WWW: http://www.cisco.com
- WWW: http://www-europe.cisco.com
- WWW: http://www-china.cisco.com
- Telnet: cco.cisco.com
- Modem: From North America, 408 526-8070; from Europe, 33 1 64 46 40 82. Use the following terminal settings: VT100 emulation; databits: 8; parity: none; stop bits: 1; and connection rates up to 28.8 kbps.

For a copy of CCO's Frequently Asked Questions (FAQ), contact cco-help@cisco.com. For additional information, contact cco-team@cisco.com.

Note If you are a network administrator and need personal technical assistance with a Cisco product that is under warranty or covered by a maintenance contract, contact Cisco's Technical Assistance Center (TAC) at 800 553-2447, 408 526-7209, or tac@cisco.com. To obtain general information about Cisco Systems, Cisco products, or upgrades, contact 800 553-6387, 408 526-7208, or cs-rep@cisco.com.

Documentation CD-ROM

Cisco documentation and additional literature are available in a CD-ROM package, which ships with your product. The Documentation CD-ROM, a member of the Cisco Connection Family, is updated monthly. Therefore, it might be more current than printed documentation. To order additional copies of the Documentation CD-ROM, contact your local sales representative or call customer service. The CD-ROM package is available as a single package or as an annual subscription. You can also access Cisco documentation on the World Wide Web at http://www.cisco.com, http://www-china.cisco.com, or http://www-europe.cisco.com.

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Use this document with the *Cisco 3600 Series Hardware Installation Guide* and the *Regulatory Compliance and Safety Information* document for your router.

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